

REMARKS

The Office Action dated September 29, 2004 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto.

The Examiner has rejected claims 17 and 23 - 28 under 35 USC 102(b), alleging that these claims are anticipated by the *Kleiman* patent (United States Patent No. 5,515,538). The Applicant does not agree.

As a matter of background, the Applicant notes that the *Kleiman* patent discusses the problem of an interrupt causing a current thread context to have to be saved so the interrupt can be serviced. The *Kleiman* patent does not discuss how operating system calls can be executed more efficiently in an SMP environment, which is the subject matter of the present patent application.

The *Kleiman* patent describes their interrupt system in the context of Solaris - a monolithic operating system based on a traditional UNIX kernel, which is distinct from the operating system of the invention. In a monolithic operating system, all operating system threads are executed as part of the kernel (and are "critical"), so there are no "non-critical" areas in the operating system. In contrast, the invention deals with operating system calls which require access to both critical and non-critical areas. Lines 1 - 3 of claim 17, for example, include limitations to an "inter-process control (IPC) message-passing operating system", which is a completely different architecture from that of *Kleiman*. This wording is reiterated in the body of claim 17 at lines 4 - 5, 9 - 10, 12 - 13 and 14 - 15.

In an IPC message-passing architecture, a typical operating system call requires access to both critical and non-critical areas of the operating system. In general, a single operating system call will access the critical area of the operating system which performs a message passing operation, which passes the message to an external (and non-critical) software process which executes to perform the balance of the operating system call.

As noted above, in monolithic operating systems such as that of *Kleiman*, all operating system threads are executed as part of the kernel and are "critical", so there are no "non-critical" areas in the *Kleiman* operating system. Thus, the *Kleiman* patent does not address the problems that the invention deals with, nor does it describe the claimed solution.

Furthermore, one skilled in the art would not look to the *Kleiman* patent for assistance in addressing the problems of the invention because *Kleiman* is dealing with completely different subject matter - improving the efficiency of their SMP system via handling of interrupts, as opposed to targeting the OS calls.

Neither the *Kleiman* patent nor Solaris have anything to do with the SMP improvement offered by the invention.

Claims 23 - 26 include the same limitations as claim 17, but claim the invention in different forms (specifically, these are system, apparatus, memory medium and signal claims respectively).

Claim 27 depends from claim 17 and includes all of its limitations, but also adds the limitation that the critical area of the IPC message-passing operating system is limited

to the message passing operation. As noted above, *Kleiman* does not discuss message-passing operating systems at all. Message-passing operating systems are well known in the art, and it is clear that Solaris is not such an operating system. It is also clear that the words “message-passing” in claims 17 and 27, are only used in the context of a “message-passing operating system” (see for example, the body of claim 17, where this term is used numerous times). Thus, the Applicant submits that “message-passing” could not be construed in a broader, non-operating system context.

Claim 28 depends from claim 27 and includes all of the limitations of claims 17 and 27. It also adds the limitation of a second message-passing operation to complement that of claim 27. The Applicant submits that a similar argument to that expressed with respect to claim 27 also applies here.

The Applicant therefore asks that the rejection of claims 17 and 23 - 28 under 35 USC 102 (b) be withdrawn.

The Examiner then rejected claims 18 - 20 and 29 under 35 USC 103(a), alleging that these claims are obvious in view of *Kleiman* in combination with *Dangelo* (United States Patent No. 5,946,487). Again, the Applicant does not agree.

As a matter of background, the Applicant notes that the title of the *Dangelo* patent is “Object- Oriented Multi-Media Architecture”. The abstract of the *Dangelo* patent describes the subject matter of the patent as: “An object-oriented, multi-media architecture provides for real-time processing of an incoming stream of pseudo-language byte codes compiled from an object-oriented source program.”

The Examiner alleged that *Dangelo* shows micro kernel operating systems could be used in the application of the invention, but this argument fails for a number of reasons. Most important is that *Dangelo's* definition of a "micro kernel operating system" is far different than the definition generally held in the art, and his definition certainly does not fall within that outlined in the specification (see page 6, line 34 through page 7, line 2 which reads that "A micro kernel operating system is one in <which> the operating system itself provides minimal services which delegate the usual operating system functions to external processes.") At lines 35 - 43 of column 9, *Dangelo* clearly defines his "micro kernel" operating system as what is known as a "monolithic" operating system, as it does far more internal processing: "The micro-kernel also attends to handling the network file system (NFS), networking operations, peripheral device drivers, virtual memory management, user interface, and other tasks for which the operating system conventionally is responsible." This is simply not a micro-kernel operating system as known in the art, and as defined in the specification.

The *Dangelo* patent describes mutual exclusion locks or mutexes, but mutexes have been known in the art for many years - mutexes are standard POSIX thread-level synchronization primitives, like the semaphores addressed in response to the previous Office Action.

Mutexes are used to ensure exclusive access to data shared between threads - not to protect operating system calls. The data being accessed is stored in memory, so the

mutexes protect that memory; in contrast, the locks used in the claimed invention protect operating system calls executing on a microprocessor - a completely different concept.

Redesigning an operating system to use mutex-like functionality for operating system calls would still not lead one to the claimed invention. The invention lies in the strategic use of locks for *only part* of the operating system call - calls to the critical areas of the operating system. This is what provides the ability to overlap non-critical areas of operating system calls as shown in Figure 6 of the subject patent application.

While *Dangelo* may describe mutexes in the context of a microkernel operating system, it does not describe any of the functionality necessary to implement the invention of claim 18, either independently or in view of the *Kleiman* reference.

Thus, claim 18 cannot be considered obvious in view of the cited combination of references. The *Kleiman* patent does not describe all of the limitations of the parent claim, claim 17, and the *Dangelo* patent does not describe the missing limitations. Further, neither of these references describe the new limitations of claim 18.

The Applicant submits that the balance of the claims distinguish over the cited references in the same manner as described above.

The Examiner also rejected claims 21 and 22 in view of *Kleiman* in combination with *Dangelo* and *Jones et al.* (United States Patent No. 5,812,844). The Applicant does not agree.


The Applicant notes that claims 21 and 22 depend from claims 17, 18, 19 and 20. Therefore, claims 21 and 22 include all of the limitations of claims 17 - 20. The *Jones*

patent does nothing to address the limitations of claims 17 - 20, with respect to which the *Kleiman* and *Dangelo* references are lacking. Because the *Kleiman*, *Dangelo* and *Jones* patents do not describe limitations of the parent claims, the Applicant submits that the dependent claims cannot be considered obvious in view of the same combination of references.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: Petition for Extension of Time